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STUDY S-336

AVAILABILITY OF GOODS IN SOUTH VIETNAM FROM 1964 THROUGH 1967

Douglas C. Dacy

January 1969

INSTITUTE FOR DEFENSE ANALYSES
PROGRAM ANALYSIS DIVISION

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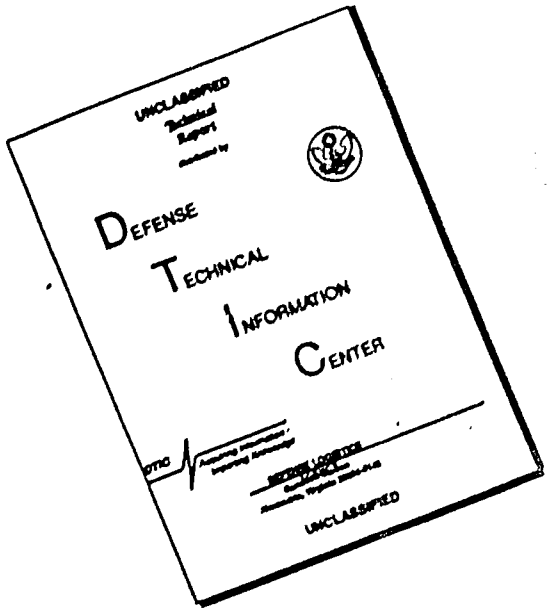

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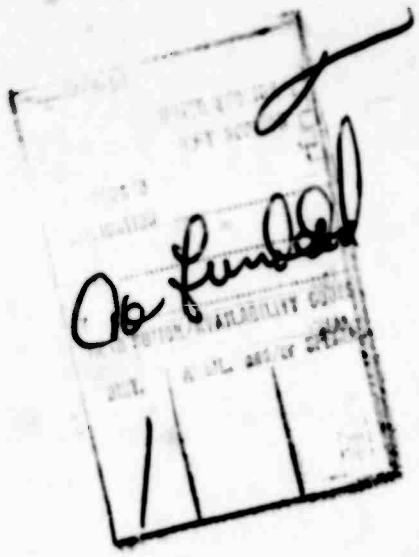

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400 Army-Navy Drive, Arlington, Virginia 22202

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FOREWORD

This Study was undertaken at the request of former United States Deputy Ambassador to South Vietnam, The Honorable Eugene Locke. At the time (late 1967) there was much controversy over the effects of the war on the South Vietnamese economy. The diverse opinions of different observers frequently were formed out of prejudice at the worst or were based on casual observation at best. In any event, it was difficult to make a convincing argument one way or the other.

The feature of the controversy that disturbed me most was that there seemed to be no way of verifying or assessing any of the general conclusions that people were reaching. To avoid the personal approach, I turned to South Vietnam's National Institute of Statistics (NIS) for data. To my knowledge this is the first study made of economic change in wartime South Vietnam that relies primarily on statistics published by the NIS. These data are reported to the Institute by various government agencies and, in some cases, their quality is open to question. The agricultural production data in particular are of uncertain reliability. Nevertheless these data are the only numbers that exist in any systematic form and, can be checked by anyone with a disposition to controvert the analysis based upon them. It is a considerable academic advantage to be able to lay one's cards on the table.

The appropriateness of data depends upon the way they are to be used. Absolute values may be misleading. For example, no serious student of Vietnam agriculture believes that the rice output for the 1966-1967 crop year was 4.3 million metric tons. The Ministry of Agriculture consistently has overestimated rice production. However, bad reporting about the level of agricultural output does not necessarily forbid its use in an index linking one year to the next. In fact,

the relative values of an index of crop production would be correct so long as the bias in crop estimation is consistent. In that case, the percent change in output from one year to the next would be accurate even though the absolute values in each year are wrong. This Study deals with measurement in percent change in output and not absolute levels in output. Thus, the NIS data can be used with a higher degree of confidence than that which one might ordinarily attribute to it.

An expert on the Vietnam economy, Dr. Leroy Wehrle, has reviewed this essay. The major thrust of his review is that I have based my analysis on generally unreliable data. Dr. Wehrle believes that some of the data series I have employed (notably the one for pig slaughtering) has a downward bias because, as the government placed more and more controls on the economy, farmers learned to evade those marketing channels which are the sources of NIS statistics. In light of his comments and the reservations I state in the last section of this Study, the reader should be warned in advance that my calculations of change should be taken as approximations rather than as precise estimates.

Numerous people have read drafts of this Study offering useful comments and others offered encouragement on this venture which seemed risky at the time. I especially appreciate the written comments of J. A. Stockfisch. They caused me to clarify several technical points although I am sure I have not exactly satisfied him. I have also benefited from conversations with other of my IDA colleagues, William A. Niskanen, Harry Williams, James A. Brown, Rolf R. Piekarz, and Neil S. Weiner. Professor Robert E. Kuenne of Princeton was also kind enough to comment on an earlier draft.

D. C. D.

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I

INTRODUCTION AND SUMMARY

This Study outlines the major changes in the economy of South Vietnam during the period 1964 through 1967. This particular four-year span was selected for study because it was highly controversial in many ways. The years 1964 and 1965 were marked by considerable political instability, and also they were years highlighted by the entry of the United States into the war on a large scale. Partly because we knew so little about the South Vietnamese economy and partly because the war itself generated an emotionally charged atmosphere in the United States, some Americans imagined that the Vietnamese economy was substantially destroyed. Many tended to regard this period as one dominated by massive efforts to defoliate forests, destroy crops with chemicals, and demolish small villages, driving thousands of rural people into South Vietnam's large cities. All these things did happen to some degree and the country underwent some significant changes, but the economy of South Vietnam was not destroyed in the process.

The succession of governments which followed the overthrow and assasination of Ngo Dinh Diem promoted a most uncertain political environment. Suspicion and infighting within the armed forces and the political disarray of the country established conditions in which the Viet Cong were able to consolidate their authority over rural areas and disrupt the normal channels of trade between the countryside and urban centers. The rapid buildup of logistic bases and troop strength by the United States and military and para-military forces by the Government of South Vietnam (GVN) imposed severe pressures upon a relatively fragile economy. Conscription of manpower by the GVN and Viet Cong reduced the supply of labor available for the production of local products, while deficit financing increased the money supply. In addition, the United States bid for available labor

and eventually hired close to 150,000 civilians. This labor was paid with piasters that were purchased with US dollars. However, these piasters, in large measure, were newly printed by the GVN. The result was a threefold increase in prices between 1964 and 1967, and that probably is the clearest single indicator of the economic stresses which beset South Vietnam during the period of this study. In short, it was a period that presented extremely adverse conditions for economic progress.

Despite the adversity of the war and the political and economic uncertainties which followed from it, the South Vietnamese economy, buttressed by massive US aid, moved ahead at a rapid pace in the four year period. Little can be said about the distribution of the economic gains; however, conclusions regarding the total economic gains can be summarized as follows:

(1) Total availability of goods increased approximately 20 percent;

(2) availability of domestically produced agricultural products declined 9 percent;

(3) industrial production increased by at least 45 percent;

(4) consumable imports doubled; and

(5) the increase in available goods did not come because of a reduction in the capital stock or because of a reduction in the foreign exchange balance.

In Section II we examine the question of measure of growth and welfare in order later to formulate a model for our analysis. The following sections investigate transportation and communications, agriculture, industry, and foreign trade. (More detail on these "sectors" are provided in the appendices.) In the final section, agriculture, industry and foreign trade are combined into an index of availability. This section also includes some pertinent remarks on the characteristics of the economic welfare measure used in this study.

II

MEASURES OF GROWTH AND WELFARE

A. NATIONAL INCOME IN GENERAL

Usually, economic progress is measured by annual changes in national income. National income has the advantage of being single-valued and, therefore, year-to-year comparisons appear to give an unambiguous indication of change. Given the proper conditions national income may have another advantage: it can be used as an indicator of economic welfare. However, whether it is a good measure of welfare depends upon many conditions.[1] Two of these conditions are of particular relevance:

> (1) The problem of imputation. Many goods and services consumed by individuals are not produced within the sphere of the market economy. To include these goods and services in national income, it is necessary to assign them a value (at market prices, if possible). The degree to which one is willing to accept total imputed values depends upon how large that total is in relation to the national income. If the nonmarket sector is relatively large, the problem of imputing a money value to goods which are not actually priced in the market is difficult. In the process of development, as the nonmarket sector shrinks relative to total economic activity, imputation becomes less important--and also more accurate. Or, as more and more economic activity falls within the orbit of the price system, imputation becomes less necessary.

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1. The conditions under which a change in national income can be used as a measure of change in social welfare have been debated widely in economic literature. See especially Paul A. Samuelson, "Evaluation of Real National Income," Oxford Economic Papers, January 1950. The use of the term "national income" creates some other difficulties. For a system which has any indirect taxes, net national product is the proper concept to use. It is conceivable that net national product and national income could move in opposite directions and income distribution could change as well. In that case national income would give a false indication of change in welfare. However, this important theoretical point is of little practical significance to this study.

(2) The problem of government services. Government services are not valued at market prices for, in many instances, there is no market demand for these services. The usual procedure is to value those services at factor costs. In some cases there probably is a tendency to extend government services beyond the amount that would be demanded in a free market economy so that the result is an overvaluing of government services. To illustrate this point, if US citizens purchased defense services in the market, would they choose to buy 80 billion dollars worth? If they should desire to buy less than 80 billion dollars worth of defense, the national income accounts would overstate aggregate economic welfare. On the other hand, the government can provide many services having external benefits. In this case, valuing the services at factor costs understates their true value.

Thus, if one wishes to make a welfare statement on the basis of the national income accounts he must proceed with caution. The following generalization applies: National income is an adequate proxy for welfare if the economy is highly market-oriented and if government expenditures are relatively small compared with total national income. For national income to be a good proxy when the opposite conditions prevail, the cost imputations for nonmarket activity must be correct and the government must produce just the amount of services for which people are willing to pay.

Another problem in equating welfare with national income is seen in the familiar accounting equation for national income,

$$Y = C + I + G + X - M.$$

We have already discussed G (government expenditures). The above equation implies that exports (X) add to welfare, and imports (M) subtract from it. This equation reflects the "activity" side of national income more than current welfare. Actually, imports add to current welfare and exports subtract from it; but in generating domestic production activity, just the opposite is true. Investment and exports have a future welfare effect rather than an immediate one.[2]

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2. Considering wealth (or discounted future earnings) as a measure of welfare, investment adds to current welfare. Section VII of this study attempts to deal further with investment and exports.

B. NATIONAL INCOME AND WELFARE IN SOUTH VIETNAM

The character of the economy of South Vietnam hardly approximates the conditions under which welfare legitimately can be equated with national income. Changes in national income do not appear to be a good proxy for inferring welfare changes for the following reasons:

(1) A significant part of the economy is not market-oriented and, therefore, the estimate of national income is not likely to be accurate.

(2) Government expenditures, at least in the last couple of years, have been a very large percentage of the national income and valuing government services at factor costs very likely overstates the degree to which they are valued by the South Vietnamese.

(3) There is not even approximate parity between exports and imports. Today, total exports are only about 3 percent of imports. (This figure applies to the trade balance; it excludes invisibles.)

(4) Recent estimates of the national income, particularly for 1966 and 1967, are likely to be much less reliable than for previous years due to the difficult adjustments which have to be made regarding deductions and the price inflation in those years.

C. AVAILABILITY AS A MEASURE OF WELFARE

Another measure of welfare is the concept of "total availability." Total availability is the quantity of goods available in any given year to satisfy consumer wants. Consumer requirements in any given year can be satisfied from previous stocks, the annual domestic output, and imports less exports.

Total availability can be derived in a way similar to the derivation of national income. That is, it can be estimated as the sum of income originating by industry with certain adjustments. The adjustment procedure adds imports and beginning stocks to domestic output and subtracts exports.

$$TA = \Sigma Y_j + M - X + S_o,$$

where

TA = total availability,

Y_j = income originating in jth sector,

M = imports,

X = exports, and

S_o = beginning stocks.

Total availability as defined above equals national income under the condition that foreign trade for the year is in balance and beginning stocks are zero. The last condition clearly is never fulfilled. However, percent change in national income will equal percent change in total availability as long as the trade balance is zero (or imports and exports change proportionately with domestic output) and beginning stocks are a constant percentage of domestic output. The major difference between total availability and national income is the manner in which exports and imports are treated. A trade balance surplus increases national income even though it decreases current consumption; however, it increases domestic capital and thereby increases future potential consumption. By contrast, the opposite treatment of the trade surplus in measuring total availability stresses current consumption at the expense of future consumption.

D. A PRACTICAL METHOD FOR ESTIMATING NATIONAL INCOME AND TOTAL AVAILABILITY

To determine total availability for South Vietnam, we have to accept a method which is less precise than that indicated in the above equation. Since there are no reliable estimates on income originating by sector, it is necessary to adopt an alternative estimating procedure. Fortunately, the product flow relationship for the South Vietnam economy is of such character that the need for any precise figures on national income originating by industry division is eliminated.

Accounting in terms of income originating was designed in order to eliminate "double counting." In highly developed countries, outputs of most industries are used as inputs into most other industries,

therefore, the notion of value added is essential to insure that outputs do not get counted many times. But in underdeveloped countries, particularly those which are primarily agricultural, the product flow relationships are relatively simple and the problem of double counting is not great. To understand how the problem disappears, it is useful to imagine a primitive kind of economy, call it a 100 percent rice economy--nothing else is produced. In that economy, total output (national income) can be reckoned simply as total rice production.

It is possible to extend the simplest model into one only slightly more complicated which consists of three sectors: agriculture, industry, and foreign trade. Assume that

(1) agriculture produces food for domestic consumption and exports the surplus,

(2) the total output of industry is consumed as final demand within the country, and

(3) the foreign sector supplies inputs for agriculture (fertilizer and machinery) and industry (raw materials and machinery) and some products for final demand.

Accounting for national income in this hypothetical economy is straightforward. One simply combines agricultural and industrial production less the foreign input components to obtain the national product.

$$NP = \Sigma Q_j P_j - \Sigma N_j P_{Nj},$$

where,

Q_j = the output in jth sector,

P_j = the price of output in jth sector,

N_j = total inputs used in jth sector exclusive of value added components, and

P_{Nj} = the unit price of inputs used in jth sector.

For illustration, let us assume the following product flow matrix:

Supplying Sector: Contributes to	Using Sectors: Agriculture	Industry	Foreign Trade (exports)	Final Demand Consumption	Total Output
Agriculture	15		25	75	115
Industry				50	50
Foreign Trade (imports)	10	20		20	
Labor	90	30	—	—	
Total	115	50	25	145	

The net national product can be derived from the table by subtracting the value of inputs (N_jP_{Nj}) from the value of outputs (Q_jP_j).

	Value of Output (Q_jP_j)	Value of Inputs (N_jP_{Nj})	Net
Agriculture	115	25	90
Industry	50	20	30
Net National Product	165	45	120

Net national income is computed by adding consumption and exports and subtracting imports.

$$NNI = C + X - M$$

$$NNI = 145 + 25 - 50 = 120$$

This, of course, is a contrived example. However, the model for the example establishes a starting point for estimating national product to a first approximation in some underdeveloped countries where the input-output relations are simple. In Section VII of this paper we have employed the methodology proposed above in order to derive a single measure of economic change in South Vietnam since 1964.

III

TRANSPORTATION AND COMMUNICATIONS

The transportation system of South Vietnam contributed 4 percent of the net domestic product in 1964.[1] Of course, this relatively small figure is not an adequate indication of the importance of the transport sector. Transportation is a necessary input into other economic activities and any significant curtailment in South Vietnam's ability to transport goods would reduce total output by an amount considerably in excess of the reduction in transport. Transportation facilities impose a serious bottleneck to economic development; therefore, a view of the current state of these facilities is a good starting point for a study of the South Vietnam economy.

Transportation is the economic category most jeopardized by the war. The survival of this activity has been dependent almost wholly upon security provided by the Allied forces. A revival of the transportation and communications systems can be taken as an indirect measure of the change in the security situation. To some extent, it is also a measure of increased capital and better managerial practices than those which prevailed in the past.

South Vietnamese goods are carried to market centers primarily by way of the national highway system. However, canals have been important in the past and South Vietnam has a good railway system and a rapidly growing air transport system. Little data exist on the activity levels of any of these branches of transportation--particularly in canal traffic. It is assumed that shipments of rice and other agricultural products via the canals in the Delta have declined since 1964. For lack of data we were unable to verify this

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1. Viet Nam National Institute of Statistics, Viet Nam Statistical Yearbook, (1964-1965), Table 298, p. 418.

commonly held supposition; yet, we do not doubt that the Viet Cong have been more successful in controlling the canals than any other artery of commerce. Thus, it is likely that the canals were used less in 1967 than three years earlier. For the highway system, the railroad, and the air transport system, there is some evidence of revival in transportation activity since 1964.

A. THE NATIONAL HIGHWAY SYSTEM

The national highway system of South Vietnam includes approximately 3800 kilometers of roads. Some of the system has been damaged by the war and much of it has been unsafe for travel. To give a general idea of how much of the system has been in use, some estimates are given in Table 1, but these estimates should be accepted with skepticism. Almost any highway could have been closed down, at least temporarily, by the Viet Cong during the period of this study. Furthermore, a highway may be open to traffic but only slightly travelled.

Table 1

VIETNAMESE NATIONAL HIGHWAY SYSTEM OPEN TO TRAFFIC
1965 THROUGH 1967[a]

Year	Kilometers Open	Percent of Total
1965	2165	57
1966	2925	77
1967	3075	81

a. Source: Engineering Division, Highway Branch, Agency for International Development, Saigon.

The major arteries of commercial traffic are Routes 4 and 8A in the Delta and Route 20 from Saigon to Da Lat. (See map.) Most of the vehicles on the Delta route have to use the major Mekong River ferries where some records have been kept by the government on vehicular crossings. The largest ferry station is at My Thuan which

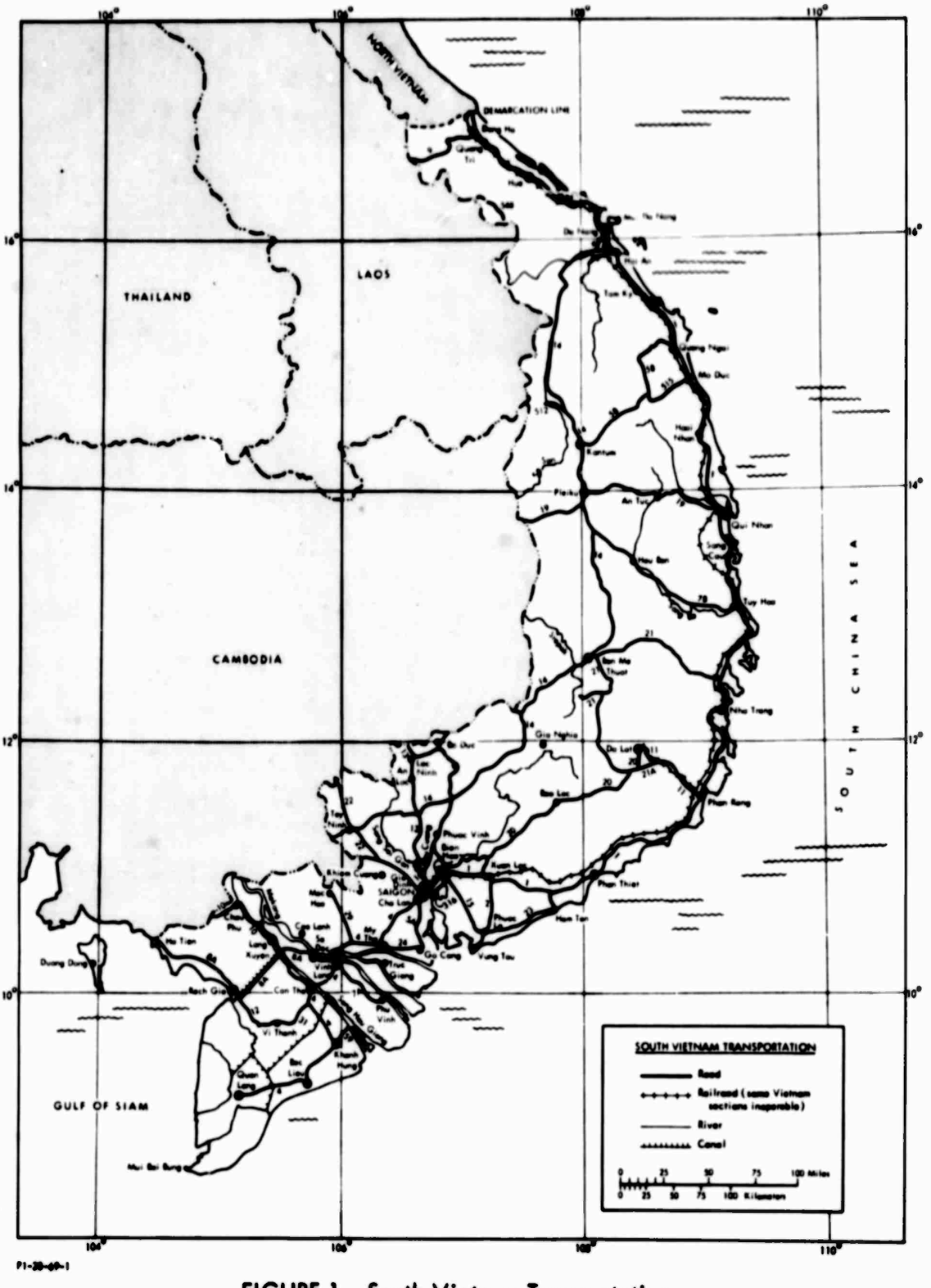

FIGURE 1. South Vietnam Transportation

is located eight kilometers upstream from Vinh Long on the Bassac. Route 4 crosses the Mekong at Can Tho and Route 8A crosses at Vam Cong. Table 2 shows the average daily crossings by type of vehicle. Evidently, Delta traffic picked up considerably in 1967. The number of heavy vehicles crossing the My Thuan, Can Tho, and Vam Cong ferries increased by 24, 14 and 12 percent, respectively.

Table 2

NUMBER OF VEHICLES CROSSING THE BASSAC AND MEKONG RIVERS, 1965 THROUGH 1967
(Civilian Vehicles Only - Average Daily Rates)[a]

Year	My Thuan		Can Tho		Vam Cong	
	Heavy	Light	Heavy	Light	Heavy	Light
1965	481	103	187	49	155	44
1966	475	87	193	42	152	43
1967	588	99	220	49	189	51

a. Source: Planning Division, Directorate of Highways, Ministry of Public Works, South Vietnam. These data exclude two- and three-wheel vehicles.

B. AIR TRAFFIC

Domestic air traffic, as measured by Air Vietnam flights, has tripled since 1964 and has increased by 250 percent, if measured by the number of passengers. The number of passengers travelling by rail decreased by about half a million from 1964 to 1967, but those travelling by air increased. Air freight increased even more rapidly than passenger service, but the total tonnage carried was small. Annual rates of improvement are given in Table 3.

C. RAIL TRAFFIC

Rail traffic, after dropping to very low levels in 1965 and 1966, revived in 1967 to a remarkable degree. The number of passengers carried by the railroad was still less than half of what it was in 1964, but for every passenger who travelled by rail in 1966 four

Table 3

ANNUAL RATES OF IMPROVEMENT IN TRANSPORT ACTIVITIES
1964 THROUGH 1967[a]

Activity	Percent Increase over Previous Year		
	1965	1966	1967
Railways			
Passengers	- 84	- 45	326
Freight	- 48	47	166
Air (Private)			
No. of Flights (Air Vietnam)	95	22	23
Passengers	105	19	44
Freight	211	29	17
Mail	97	19	15
Internal Mail	4	1	8
National Highways Open to Commerce		35	5
Railroads Open to Commerce	- 78	0	76

a. Source: Appendix A, Table A-4.

and one-half travelled in 1967. Tonnage carried by the railroad not only completely revived, but 1967 was the best year on record in the history of the South Vietnam railroad--and this was accomplished with only one-third of the total lines in operation. (Approximately 475 kilometers were open in 1967.) Most of the tonnage carried on the South Vietnam railroad was bulky materials such as concrete aggregates, and the distances they were carried were relatively short. Thus, while the number of tons carried doubled between 1964 and 1967, ton miles were only about one-fourth as much in 1967 as in 1964. Passenger service has also been limited to short distances.

D. MAIL

An indication of communications in South Vietnam is the mail service. Measured both by number of letters sent and tons of mail carried by Air Vietnam, communication increased slightly from 1964 to 1967.

IV

CHANGES IN AGRICULTURAL OUTPUT

Agriculture is the major economic activity in Vietnam. In 1964 about one-third of the gross national product was attributed to agriculture,[1] but the agricultural sector employed at least one-half of the total work force. While South Vietnam is commonly thought to be a rice economy, there are other agricultural products (interpreted to include fishing and forestry) of considerable economic importance. Noteworthy among these are fish, pork, timber, rubber, and vegetables. Table 4 shows how the output of South Vietnam's major agricultural products changed over a three-year period.

Table 4

INDEXES OF AGRICULTURAL CHANGE IN SOUTH VIETNAM, 1964 THROUGH 1967
(1964 = 100)

Commodity	Weight[b]	1965	1966	1967
Agricultural Crops	(134)			
Paddy Rice	100	93	84	86
Manioc	4	82	100	91
Sweet Potatoes	5	92	82	84
Sugarcane	3	104	89	73
Peanuts	1	92	94	94
Rubber	14	81	67	57
Tea	2	109	96	78
Vegetables	5	124	133	178
Animal Products	(100)			
Pork	45	114	100	105
Fish	55	94	96	100
Timber Production	16	105	87	68
TOTAL	250	98	90	91

a. Source: Computed from Appendix A, Table A1.
b. See Appendix B.

1. See Table 298, p. 418, National Institute of Statistics, Viet Nam Statistical Yearbook, 1964-1965.

A. SOME MAJOR DECLINING PRODUCTS

Production of rice, rubber, and timber declined over the period studied. These three products comprise more than one-half of the index of agricultural production as it is measured in Table 4 and their decline caused serious food and international payment problems for the South Vietnamese.

In 1963, South Vietnam exported 323 thousand metric tons of rice but in 1967 it imported 770 thousand tons.[2] This turnaround of approximately 1.1 million metric tons is the best measure of the severity of the rice situation in South Vietnam. In 1963, South Vietnam was the world's fourth largest exporter of rice[3] and, in 1967, it was the world's largest importer.

Rubber production declined from 69 thousand metric tons in 1964 to 39 thousand tons in 1967.[4] Peak production occurred in 1961, when 71 thousand tons were produced. The steady decline of rubber has been a direct result of the intensification of the war with the obvious effect of loss of security in rubber-growing regions, loss of labor, and loss of incentive to produce due to what is commonly believed to be high Viet Cong taxes on rubber production. The loss of production can be explained by a reduction in planted area actually exploited and a loss in output per hectare. Between 1964 and 1967 exploited areas declined by 24 percent and output per hectare by 15 percent.[5]

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2. National Bank of Viet Nam, Annual Report, Fiscal Year 1967, Ch. 2.

3. The three largest were Burma, Thailand, and Mainland China, FAO Trade Yearbook, 1965, p. 100.

4. These figures are based upon plantations or groups of plantations of more than 500 hectares as reported by the National Institute of Statistics in the Monthly Bulletins and Statistical Yearbook. Total production in South Vietnam, including that from small holdings, was approximately 42 thousand tons in 1967. National Institute of Statistics, Economic Situation in Viet Nam, 1966, Table A-2, Saigon, 1967.

5. Ibid. Table A-2. Exploited area data from NIS, Monthly Bulletin of Agricultural Statistics, April 1968.

The decline of rubber also has had a major impact on South Vietnam's export trade to which it regularly contributed more than all other products taken together.

Another major casualty of the war has been timber production. South Vietnam has relatively large forest reserves which have never been properly managed but the war has greatly aggravated the situation. According to one report,

> Log extraction has been hazardous and wood labor scarce: Defoliation has modified large areas with unforeseen results, bombardment ... renders /trees/ useless for processing ... loggers are exposed not only to Viet Cong harassment but to the possibilities of bombardment by Allied aircraft.[6]

According to official estimates timber production declined by 32 percent between 1964 and 1967.

B. OTHER AGRICULTURAL PRODUCTS

Agriculture in South Vietnam is dominated by rice production. However, there are a few crops of some local importance. Sugarcane is a fairly important crop in Gia Dinh and Quang Ngai provinces, sweet potatoes are grown in Quang Ngai, manioc in Tay Ninh, peanuts in Binh Dinh, and tea is very important in the Lam Dong province. These crops are also grown to lesser degrees in most of South Vietnam's provinces. Production of each of these crops has been hindered by the war as can be seen in Table 4.

The only bright spot in South Vietnamese agriculture for the period under consideration was vegetable production. The overall gain for South Vietnam over the three year period was 78 percent. Most provinces have shared in this gain as vegetables have become a very important cash crop for South Vietnamese farmers located close to the large cities and provincial capitals.

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6. Henry S. Kernan, "Preliminary Report on Forestry in Vietnam," Working Paper No. 17, Joint Development Group, Saigon, January 1968, pp. 3 and 54.

C. PROTEIN FOODS

Working class Vietnamese spend almost twice as much on protein products as they do on rice. The principal protein foods are fish, pork, beef, chicken, duck, eggs, and milk. Of those products fish and pork are by far the most important. For 1966, the Directorate of Fisheries estimated that 254 thousand persons were engaged as fishermen. To compare, this number is fully two-fifths of the total number estimated to be employed in industrial and commercial establishments.[7] The number of persons who raise hogs (part time) is undoubtedly much larger than the number of fishermen as most farmers keep some pigs. We have estimated that fish and pork taken together are equally important with rice in Vietnamese agriculture,[8] with fish slightly more important than pork.

Production of fish and pork have changed little between 1964 and 1967. According to NIS estimates, pig slaughterings increased 5 percent and fish recovered its 1964 level after declining in 1965.

D. TOTAL OUTPUT OF AGRICULTURE

Total agricultural output was 9 percent lower in 1967 than it was in 1964. Computation of the total index is discussed in Appendix B.

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7. See National Institute of Statistics, Viet Nam Statistical Yearbook, 1966-1967, Tables 85 and 272.

8. See Appendix B for justification of this estimate.

V

CHANGES IN DOMESTIC INDUSTRY

A. INDUSTRIAL PRODUCTS

Industry has emerged as a significant activity in the South Vietnamese economy. In 1964, manufacturing contributed about one-third as much as agriculture to the gross domestic product in South Vietnam.[1]

Because new manufacturing industries are located in secure areas, the war did not have the adverse effect on the growth of industrial production as it did in the case of agriculture. For the period under consideration, the index of industrial production increased 45 percent. Table 5 shows the growth of all the major subclassifications under industry. Note the very rapid growth in plastic articles, electrical equipment, tobacco, and beverages. The textile industry which had shown significant gains to 1966 fell off in 1967 and, due to the competition from imports, will probably continue to decline in the future.

According to an estimate of the Labor Ministry only 120 thousand persons were engaged in manufacturing in 1966. This was a gain of only 5 percent over the figure reported for 1960.[2] There are no estimates on the number employed in manufacturing in 1964 but it is not likely that it was less than in 1960. Since manufacturing output increased by 45 percent and the labor force by a maximum of 5 percent between 1964 and 1967, output per man-year increased by at least 38 percent during that period. This high figure is believable given the composition of South Vietnamese manufacturing. Beverages and tobacco

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1. National Institute of Statistics, Viet Nam Statistical Yearbook, 1966-1967, Table 241.

2. Ibid., p. 362.

Table 5

YEARLY INDICES OF INDUSTRIAL PRODUCTION, 1964 THROUGH 1967[a]

(1962 = 100)

Class of Product[b]	Weight	1964	1965	1966	1967	Percent Change 1964 - 1967
General Index	100.0	132	158	171	191	45
Manufacturing Industry	93.5	133	160	173	194	46
Foodstuffs	14.5	93	106	115	127	37
Beverages	45.1	148	182	189	215	45
Tobacco	13.7	120	148	171	221	84
Textiles	10.8	144	162	170	155	8
Wood and Wood Manufacturing	0.5	5	9	4	5	0
Paper	1.1	150	146	219	129	- 14
Chemical Products	1.9	147	187	176	165	12
Glassware	.9	128	117	129	144	13
Iron & Steel	1.1	118	143	166	39	- 67
Electric Equipment	0.8	118	167	291	366	210
Plastic Articles	0.5	183	358	445	610	233
Electricity	5.2	129	168	174	197	53

a. Source: National Institute of Statistics, Monthly Bulletin of Statistics, October 1968, Bulletin, No. 10.

b. This table includes only those products for which the weight in the general index is greater than or equal to 0.5 percent.

manufacturing account for three-fifths of the manufacturing index. Their weighted increase since 1964 was 54 percent; yet, in 1967 the three major beverage firms and three major tobacco firms[3] employed only about 5,000 persons and probably produced 90 percent of their industries' output. These industries probably increased their work force very little over the period. Simply netting out beverages and tobacco would reduce the man-year productivity gains of other industries to 27 percent.

3. Brasseries et Glaciers d L'Indochina (BGI), Societe de Eaux Gazeuses D'Indochina (SEGI), Phuong Toan, Manufactures Indochinoises de Cigarettes (MIC), Manufacture Indochinoise de Tobacs et Cigerettes (MITAC), and Societe Indochinoise de Tobacs, J. Bastos (BASTOS).

The growth rate of South Vietnamese manufacturing industry during the war is impressive. However, to properly interpret the significance of this growth in terms of availability of goods, one should understand that the total manufacturing activity in South Vietnam is small. Thus, the 45-percent increase should be placed in its proper perspective.

B. PRODUCTION OF ELECTRICITY

One of the major indicators of economic development is generator capacity. Despite the war, output of electricity in South Vietnam increased by 53 percent (1964 through 1967) and additional capacity is still being constructed. Power generation in Saigon added over 200 million kilowatt-hours in three years, but all parts of the country gained. Table 6 shows the percentage gains through 1967.

Table 6

PERCENT GAINS IN ELECTRICITY PRODUCTION IN SOUTH VIETNAM BY AREA[a]
1964 THROUGH 1967

Area	Percent Gain Through 1967
Saigon Metropolitan	62
(Production at Danhim)	(total loss)
Other South	100
Central Lowlands	129
Central Highlands (excluding Danhim)	27

a. Source: Appendix A, Table A-3.

The Danhim output was completely closed in May 1965. This was South Vietnam's biggest hydro plant and had a capacity of 160,000 kwh. It began operation in October 1964 and was shut down completely in May 1965 due to sabotage of the 230-kv transmission lines to the Saigon area. The loss of this major source of power resulted in a crash program in Saigon to replace cheap hydro power with relatively expensive diesel power.

C. NEW INDUSTRIES

Some new industrial capacity, which does not show up in the index of industrial production, was introduced into South Vietnam during the war period. New products such as cement, asphalt shingles, plywood, millwork, plastics, and canned milk are among the most prominent ones. The production of cement is the best example of a dramatic wartime change. In 1963 South Vietnam produced no cement. A clinker plant at Ha Tien and a cement plant at Thu Duc were completed in 1964 with a 300-thousand-ton capacity which, at the time, was expected to take care of three-fourths of the total South Vietnamese requirements. As can be seen in Table 7 local needs increased much faster than the government had anticipated, and cement production did not reach its capacity due to Viet Cong interdiction of barge traffic in Vietnam's Southern canal system.[4] Even so, in 1967 the cement plant supplied 28 percent of South Vietnam's cement needs. This industry, developed entirely during the war, is likely to become an important supplier of building materials in postwar Vietnam.

Table 7

DOMESTIC PRODUCTION AND CEMENT IMPORTS, 1964 THROUGH 1967 [a]

	Year			
	1964	1965	1966	1967
Domestic production (000 tons)	75.3	189.3	134.7	180.8
Imports (000 tons)	437.4	426.1	365.1	476.2
Total availability	512.7	615.4	499.8	657.0
Percent produced in Vietnam	15	13	27	28

a. Source: National Institute of Statistics, Monthly Bulletin of Statistics, October 1968.

4. National Bank of Viet Nam, Annual Report, Fiscal Year 1966, p. 15.

VI

FOREIGN TRADE SECTOR

A. FOREIGN TRADE IN GENERAL

Today, the foreign trade of South Vietnam for all practical purposes is imports. (In 1964, the value of merchandise exports was 16 percent of imports, and in 1967 it was only 3 percent.) Consequently, for the purpose of any approximate calculation, it is valid to ignore exports which reduce total availability. Imports, on the other hand, add significantly to the South Vietnamese standard of living.

While imports add to the material standard of living, it would be a mistake to add their total value to domestic output in order to calculate total availability. Much of the import trade is in raw materials for domestic industrial and agricultural production. Thus, it is necessary to net out all the categories of imports which are directly consumed (foodstuffs, pharmaceuticals, motorcycles, etc.) and those which serve as intermediate products to activities not included in the index of industrial (cement, iron, and steel products used mainly for construction, etc.) or agricultural production. These goods are called "nonduplicated" imports in Table 8.[1] This class of imports does include construction materials which is reasonable since these commodities have not been counted elsewhere.

To establish the relative importance of nonduplicated imports in the Vietnamese standard of living, their value was compared with the imputed value of rice consumption in 1964 (Appendix C). At market

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1. The annual import figures do give an indication of goods made available by importers but may give an inaccurate view of the actual absorption of goods. Therefore, data on the rate at which goods were actually being consumed would be more desirable than the present data. However, it is true that goods are available, in a technical sense, when they arrive in Vietnam.

Table 8

IMPORTS INTO SOUTH VIETNAM, 1964 THROUGH 1967[a]

Year	Total Value of Imports		Nonduplicated Imports		
	Million, US $	Billion, Piasters	Billion, Piasters	Index of Real Value 1964 = 100	Index by Weight 1964 = 100
1964	298	10.4	4.6	1.00	1.00
1965	357	12.5	5.9	1.28	1.24
1966	496	28.4	14.1	1.87	1.88
1967	538	43.0	21.9	2.18	2.01

a. Source: Appendix C

prices (wholesale), it appears that the Vietnamese value this class of imported goods at one-third of the value they placed on rice.

B. THE SPECIAL CASE OF RICE

Rice imports have not been included in nonduplicated imports since no rice was imported in 1964. The simplest way to account for the importation of rice is to adjust the index of agricultural production. This can be done by adding the quantity of rice imports to domestic production (in milled equivalents) and recomputing the index of agricultural production. (See Appendix D.) While the index of agricultural production for 1967 was 91 (1964 = 100), when adjusted for rice imports (index of agricultural availability) the revised index is 103.

VII

MATERIAL WELFARE FROM DOMESTIC AND INTERNATIONAL SOURCES

A. DERIVATION OF AN INDEX OF TOTAL AVAILABILITY

In order to measure the progress in material welfare in South Vietnam since 1964, we define material welfare as the gross availability of goods for consumption and investment. As explained earlier, availability of goods can be derived from a product flow matrix of the Vietnam economy. (Section II D.)

$$TA = \Sigma Y_j + M - X + S_o. \qquad (1)$$

Recall that Y_j denotes income originating by sector.

For South Vietnam, we shall assume that there are only three goods-producing sectors: agriculture, industry, and foreign trade. Also we shall assume that the outputs of industry and agriculture do not depend upon cross inputs. Inputs into agriculture and industry are obtained from the foreign trade sector and to a certain extent from the same sector, i.e., agriculture uses seed from agriculture and fertilizer from trade.

Given the above assumptions and our concern with relative change rather than absolute values, it is possible to revise the total availability equation to eliminate the need for data on income originating by sector. The first step is to subtract from imports all of the commodities which are used as inputs into industry and agriculture. That step assures that imports will not be double counted in computing total availability. The remaining imports satisfy final demand and they should be counted in total availability. With this adjustment to the import total the availability formula can be rewritten,

$$TA = \Sigma Q_j - \Sigma N_{jj} + M_f - X + S_o, \qquad (2)$$

where

Q_j = total output of the jth sector,

N_{jj} = value of inputs from jth sector to the jth sector, and

M_f = imports destined for final demand.

For our immediate purpose the equation can be written specifically,

TA = (Output of Agriculture - Agriculture inputs) + (Output of Industry - Industrial Inputs) + Final Demand Imports - Exports + Beginning Inventories.

The next step is to eliminate the ΣN_{jj} since we are not likely to know that value. This can be done by assuming that the inputs from the same sector are a constant percentage of total output.[1] Specifically, this would mean in the case of rice production that the seed requirement is proportional to total rice output. Furthermore, it is convenient to assume that beginning stocks are proportional to total domestic output. With those assumptions Eq. 2 is reduced to

$$TA = (1 + k)\Sigma (1 - a_j)Q_j + M_f - X, \qquad (3)$$

where

k = the percentage of inventories to output (so many month's supply), and

a_j = the percentage of inputs from the same sector output.

Equation 3 is very convenient for the purpose of computing an index of availability. The separate variables first can be put into index form, allowing for the combination of quantity variables for agriculture, industry, and trade, which also obviates the need to deflate these variables for price changes. The separate indices can be assigned fixed weights and combined into a general index of availability. It is not even necessary to specify the values of k and the a_j's; it is necessary only to specify that they are constant. The following computations are dependent upon these assumptions.

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1. These percentages are the diagonal elements (the technical coefficients) in an input-output matrix.

B. INDEX OF AVAILABILITY

The index of availability combines agricultural production (adjusted for imports of rice), industrial production, and nonduplicated imports. The weights for the sector indexes are explained in Appendix E. Using those weights and the sector indexes derived earlier, estimates of total availability for the years 1964 through 1967 are given in Table 9.

Table 9

INDEX OF AVAILABILITY OF GOODS IN SOUTH VIETNAM, 1964 THROUGH 1967

Sector	Sector Weight[a]	Year			
		1964	1965	1966	1967
Agricultural availability[b]	0.68	1.00	1.00	0.97	1.03
Industrial availability	0.23	1.00	1.20	1.30	1.45
Import availability	0.09	1.00	1.24	1.88	2.01
TOTAL AVAILABILITY		1.00	1.07	1.13	1.21
(Domestic agricultural output)[c]		(1.00)	(0.98)	(0.90)	(0.91)
(Total domestic output of goods)[d]		(1.00)	(1.04)	(1.00)	(1.05)

a. Appendix E.
b. Adjusted for rice imports, Appendix D.
c. Unadjusted for rice imports.
d. This row combines the unadjusted agricultural production and industrial indexes with weights of 0.75 and 0.25, respectively.

During the four-year perioc covered in this study, availability of goods to the South Vietnamese increased 21 percent. If one considers only domestic agricultural output and domestic industry, the South Vietnamese produced 5 percent more goods in 1967 than in 1964. Thus, it appears that about one-quarter of the total gain in availability was due to domestic activities and three-quarters were due to importing of goods. But even this statement needs qualifying because the gain in domestic output was due entirely to the large

increase in industrial production (45 percent) as agricultural output declined by 9 percent. It is doubtful whether industrial production would have increased so rapidly had South Vietnamese industry been denied certain raw materials it required through importation.

C. INTERPRETATION

The term "availability" has been chosen advisedly. It is clearly related to but not synonymous with economic welfare. Also the term "goods" is always understood to follow the term "availability." Economic welfare derives from all economic activities which yield personal satisfaction and depends upon the way in which goods and services are distributed to the members of society. We have not considered the many services from which the Vietnamese derive satisfaction nor the distribution of the goods made available. Exclusion of the latter is not a serious omission, even if interesting, and would only require a change in designation to "potential welfare." For if the goods are available they can be distributed so as to maximize total satisfaction subject to the amount available.

Abstracting from the problem of distribution, there are reasons why our measure of availability understates the potential economic welfare changes which took place in South Vietnam. These reasons are:

(1) The index of physical availability made no allowance for new products or quality changes in old ones. The index was derived from data published by the Vietnam National Institute of Statistics. NIS data, however, do not cover the numerous business activities, usually small scale, which have flourished during the war. We have no measure of the growth in small metal-working shops, vehicle assembly plants, furniture manufacturing, and many other fabricating operations. These activities have developed rapidly, especially in the larger cities, and are clearly in evidence.

(2) Construction activity may not be adequately accounted for by the construction components in imports.

(3) The military has contributed some materials and much services to certain sectors of the Vietnamese economy.

(4) No account has been taken of the apparently tremendous increase in services of all kinds, particularly retail trade and personal and repair services. If the increase in services advanced proportionately with goods availability, then adding a service component would not change the index of availability. However, in countries where material goods are increasing, services advance faster. South Vietnam probably is no exception. Unfortunately, very little is known about the employment distribution in South Vietnam. Yet the Ministry of Labor statistics indicates that while persons engaged in services increased 350 percent between 1960 and 1966, comparable figures for other activities are 5 percent in manufacturing, 160 percent in construction, and 4 percent in transport, storage and communication. Employment in services in Saigon increased over 100 percent from 1964 to 1966.[2]

(5) It is believed that some goods enter South Vietnam without clearing customs. To the extent that this is true, the index of imports understates the true availability of imports in South Vietnam.

(6) It has been acknowledged that many goods from the American Post Exchanges and military supplies are stolen or otherwise become available on the black market. While these goods may be illegally exchanged, they certainly add to availability.

(7) No account has been made of the gold which is smuggled into South Vietnam and which adds to utility.

However, there are also reasons why the measure of total availability might tend to overstate the extent to which aggregate economic welfare has improved. Some of these reasons are:

(1) American and other foreign troops absorb some of the available goods although probably in relatively small amounts.

(2) A shift away from home industry to factory production of some items has probably occurred as the economy has become more monetized (although the monetization itself is a gain). If that is the case, the index of industrial production would overstate the actual availability of goods.

(3) Some goods purchased by the government and manufactured in South Vietnam may not actually be desired by the public, e.g., military uniforms. (Most other military goods are not produced at home and do not count as imports either.)

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2. National Institute of Statistics, Viet Nam Statistical Yearbook (1966-1967), Table 272.

(4) Many homes in rural areas have been destroyed and the loss of the services of these homes certainly is a drain on total availability.

In any event the reader is cautioned that our measure of economic change is in index form and for that reason some of the above listed additions or subtractions from total availability may be of little importance. We believe, on balance, that they do not change markedly the conclusion that availability of goods to the South Vietnamese increased substantially during the war. If anything, our calculated index of availability probably should be taken as a conservative estimate.

Finally, it should be noted that the population increase has absorbed some of the increase in goods. Considering that the population has increased 8 to 9 percent since 1964, availability of goods has increased rapidly enough to allow for a per capita increase of goods of about 3 to 4 percent a year.

D. RELATIONSHIP OF AVAILABILITY TO INVESTMENT AND FOREIGN EXCHANGE RESERVES

Although there are no adequate data on domestic investment over the period of this study, it is believed that the capital stock of South Vietnam has actually increased. Much of the US investments in bases, airfields, roads and port facilities (public investment) will have a future payoff for the Vietnamese. In addition, there has been some investment in farm machinery, buildings, and capital equipment financed by the South Vietnamese and the Agency for International Development. Despite much destruction to houses, the capital stock in South Vietnam at the end of 1967 probably was larger than in 1963. Thus, even though the investment problem has been ignored in this paper, it is hardly conceivable that the increase in availability came as a result of capital consumption.

The same is true with respect to exports. While the exportation of goods declined to a negligible amount, the exportation of services increased rapidly. At the end of 1967, the US government employed approximately 150,000 South Vietnamese civilians. This employment

and the local US troop expenditures were the major sources of South Vietnamese foreign exchange reserves. Foreign exchange reserves increased from about $175 million at the end of 1963 to about $325 million at the end of 1967. The gains in availability of goods calculated in this study did not come about by drawing down foreign exchange balances.

Appendix A

TABLES

Appendix A

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Table A1

PRODUCTION OF AGRICULTURAL PRODUCTS, 1964 THROUGH 1967[a]
(1000 metric tons)

Commodity	Year			
	1964	1965	1966	1967
Agricultural Crops				
Paddy rice	5185	4821	4336	4475[b]
Manioc	289	236	290	262
Sweet potatoes	301	278	246	254
Sugarcane	1055	1093	936	770
Peanuts	36	33	24	34
Rubber	69	46	46	39
Tea	5.4	5.9	5.2	4.2
Vegetables[c]	108	133	144	192
Animal Products				
Pork (controlled slaughtering, 1000 head)	1091	1249	1093	1142
Fish	397	375	381	396[d]
Timber Production	303	318	263	205

a. Source: 1964-1966, National Institute of Statistics, Viet Nam Statistical Yearbook, 1966-1967; 1967, Agricultural Economics and Statistics Service, Ministry of Agrarian Reform and Agriculture, Monthly Bulletin of Agricultural Statistics (Special Issue), April 1968.

b. National Bank of Viet Nam, Annual Report, Fiscal Year 1967, Table 1. This figure is 213,000 metric tons lower than that reported in the Special Issue of the Monthly Bulletin of Agricultural Statistics. This figure has been chosen because it seems more reasonable given the situation in South Vietnam in 1967.

c. These figures were supplied by the Directorate of Agricultural Affairs; see Table A-2.

d. Estimated by the Agency for International Development, Saigon; in Agricultural Budget Request for FY 1969.

Table A2

VEGETABLE PRODUCTION IN SOUTH VIETNAM
1964 THROUGH 1966[a]

	Cultivated Land (Hectares)			Production (000 tons)			
	1964	1965	1966	1964	1965	1966	1967
South Vietnam	8,770	11,720	12,100	107.6	133.0	143.5	192.2
Southern Region	6,500	8,590	7,885	68.1	87.9	81.7	88.5
Ba Xuyen	165	1,160	590	2.6	12.2	4.3	4.3
Dinh Tuong	500	500	950	5.6	5.0	9.5	9.5
Binh Duong	500	600	800	5.0	6.0	8.0	8.0
Hau Nghia	1,750	820	780	17.5	9.1	7.9	7.8
Gia Dinh	120	120	125	2.0	2.0	2.3	2.3
Central Lowlands	650	1,280	2,175	10.4	12.0	26.1	30.7
Quang Nam	55	15	350	.6	-	10.0	10.0
Central Highlands	1,620	1,850	2,040	29.6	33.1	35.7	73.0
Tuyen Duc	1,250	1,500	1,500	25.4	30.0	30.0	60.7

a. Source: 1964-1966, Directorate of Rural Affairs, Ministry of Agriculture; 1967, Agricultural Economics and Statistics Service, Monthly Bulletin of Agricultural Statistics, Special Issue, April 1968. All vegetable-producing provinces are not shown.

Table A3

ELECTRICITY PRODUCTION IN SOUTH VIETNAM, 1964 THROUGH 1967[a]

Region	Production (mil kwh)			
	1964	1965	1966	1967
Saigon Metropolitan	353.8	368.2	509.3	572.2
Production at Danhim[b]	41.5	53.8[c]	-	-
Other South	23.1	31.1	37.7	46
Central Lowlands	33.9	46.1	65.2	77.8
Central Highlands	17.3	23.0	22.0	22.0
TOTAL	469.6	522.2	635.3	718

a. Source: 1964-1966, National Institute of Statistics, Viet Nam Statistical Yearbook, 1964-1965 and 1966-1967. 1967, Total figure was derived by use of index of electricity output in index of industrial output. Saigon figure was taken from NIS, Monthly Bulletin of Statistics, October 1968. It was assumed that no change occurred in the Central Highlands between 1966 and 1967 and the residual gain in the 1967 column over 1966 was prorated between other South and Central Lowlands. An estimating procedure was required because the data reported in the Monthly Bulletin of Statistics for 1965-1967 is inconsistent with that reported in the Viet Nam Statistical Yearbook.

b. Danhim was Vietnam's major hydroelectric plant. It was located in the Central Highlands but supplied power for the Saigon area.

c. Estimated by the author.

Table A4

TRANSPORTATION AND COMMERCE IN SOUTH VIETNAM, 1964 THROUGH 1967[a]

Activity	Year			
	1964	1965	1966	1967
Railroads				
No. of passengers (thousands)	873	144	81	345
Passenger kilometers (millions)	124.6	14.0	3.8	12.8
Freight (thousands of tons)	299	154	227	603
Ton Kilometers (millions of tons)	127.0	30.5	13.9	28.2
Air (Private)				
No. of flights, Air Vietnam, (thousands)	11.1	21.7	26.5	32.6
No. of passengers (thousands)	268	549	655	941
Freight (thousands of tons)	1.8	5.6	7.2	8.4
Mail (thousands of tons)	0.29	0.57	0.68	0.78
Internal mail sent (millions of pieces)	38.4	40.0	40.2	43.4
National Highway System (km open to commerce)[b]		2165	2925	3075
Railroads (km open to commerce)	1200	270	270	475

a. Source: National Institute of Statistics, except when indicated.
b. Engineering Division, Highway Branch, Agency for International Development, Saigon.
c. Engineering Division, Railroad Branch, Agency for International Development, Saigon.

Appendix B

INDEX OF AGRICULTURAL PRODUCTION FOR SOUTH VIETNAM

Appendix B

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Appendix B

INDEX OF AGRICULTURAL PRODUCTION FOR SOUTH VIETNAM

The output of most of the significant agricultural, forestry, and fishing products of Vietnam is given in Table A1. Some products have been omitted only because of lack of any kind of data. The principal omissions are the protein foods, beef, chicken, ducks, milk, and eggs. Combined, these omitted foodstuffs were one-half as important as rice in the working class diet in 1964. The products included in the agricultural production index are rice, manioc, sweet potatoes, sugarcane, peanuts, rubber, tea, vegetables, pork, fish, and timber.

One way of "adding" these products together is to combine their separate yearly indexes of physical output. The only problem is that of assigning weights to the individual indexes. The weights given in Table 4 of the text were rationalized in the following way:

B1. RICE, MANIOC, SWEET POTATOES, PEANUTS, RUBBER, AND TEA

The U.S. Department of Agriculture has computed weights[1] for these products. These weights can be derived from Table E1, Appendix E. For the weighting scheme used in the present study, rice was arbitrarily assigned a value of 100, and other conversions were calculated simply in terms of their relative importance to rice. Manioc can be used as an example.

> Aggregate rice production in 1964 = USDA weight x rice production in tons
>
> Aggregate manioc production in 1964 = USDA weight x manioc production in tons

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1. U. S. Agency for International Development, Vietnam, Joint Economic Affairs Office, Annual Statistical Bulletin, No. 10, June 1967.

Manioc weight in present study equals

$$\frac{\text{Aggregate manioc prod. in 1964}}{\text{Aggregate rice prod. in 1964}} \times 100 = \frac{8.1}{197.0} \times 100 = 4.1$$

B2. VEGETABLES

To determine the weight for vegetables the total imputed value (at wholesale prices) of vegetable production for 1964 was compared with the imputed value of rice production for that year. The Saigon retail prices for principal vegetables on January 1, 1965 were:

Onion shoots	9.5 piasters per kg
Cabbage (local)	12.0 piasters per kg
Cabbage (Dalat)	12.0 piasters per kg
Stick beans	11.0 piasters per kg
Bindweed	4.0 piasters per kg

The average retail price was taken to be 10 piasters per kg and it was assumed that the average "wholesale" price was 6 piasters per kg. Since total output of vegetables in 1964 has been recorded as 107.6 thousand metric tons, the value of vegetables at "wholesale" price is estimated at 646 million piasters.

The imputed value of rice in 1964 is derived by multiplying the total milled equivalent of rice output in 1964 by the Saigon wholesale price. Rice production is estimated at 4.7 million metric tons (10 percent less than the Ministry of Agriculture figure) and the conversion rate for milled rice is taken as 0.55.

4,700,000 metric tons x 0.55 x 5500 piasters/ton = 14.2 billion piasters.

The vegetable weight is given as 0.646/14.2 x 100 = 4.5, rounded to 5.

B3. PORK AND FISH

It is more difficult to make similar calculations for pork and fish. The reason is that the marketing of these products grossly understates production (particularly for hogs). There are no figures for total hog production. It has been assumed that the value of these two products combined is equal to the value of rice. Fish is slightly

more important in the working-class (Saigon) diet than pork. For that reason, fish has been assigned a weight of 55 and pork 45. (As a crude check, let us assume that hog production in 1964 was 3 million hogs--a complete turnover of the hog population, as seems likely. Next, we can estimate the value of that production: The Saigon wholesale price was 2700 piasters per 100 kg. If hogs were slaughtered at 90 kg, the total value of hog production would have been 7.27 billion piasters. Similarly for fish: If 50 percent of the fish catch were marketable (i.e., 200 thousand tons), the total value of fish would have been 7.8 billion piasters, figured at 3,900 piasters per 100 kg (the Saigon wholesale price in 1964). These estimates indicate that fish and pork together are slightly more important than rice.)

B4. TIMBER

Timber has been assigned a weight equal to that of rubber and tea. This is an arbitrary weight. (Total timber production was estimated at 303 thousand cubic meters. Wholesale price of lumber in Saigon was 3,360 piasters per cubic meter. Figured at the lumber price--which undoubtedly is too high considering that 20 to 40 percent is lost in milling--total timber output would be placed at close to one billion piasters. On the basis of this single calculation it would appear that the arbitrary weight assigned to timber is too high. If, however, as Henry Kernan[2] has indicated, total timber production might be double or triple controlled production, then the weight assigned to timber is of the right order.)

The index of gross agricultural production is computed in the following way:

$$I_t = \frac{w_j I_{jt}}{250} ,$$

2. Henry S. Kernan, "Preliminary Report on Forestry in Vietnam," Working Paper No. 17, Joint Development Group, January 1968, p. 28.

where

I_t = general index in year t,

w_j = weight of jth commodity, and

I_{jt} = index of production of jth commodity in year t (1964 = 100).

Appendix C

IMPORTS IN SOUTH VIETNAMESE STANDARD OF LIVING

Appendix C

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Tables

Appendix C

IMPORTS IN THE SOUTH VIETNAMESE STANDARD OF LIVING

This Appendix outlines a methodology for estimating the weight of imported goods in the South Vietnamese standard of living. Given that practical constraint of data availability, the estimate must be regarded as a rough approximation.

Imports increase the availability of goods in two ways: Many imports increase availability directly (e.g., foods, radios, motor vehicles, etc.); others make possible the domestic production of goods and services and therefore add to total availability in an indirect way (e.g., industrial machinery, chemicals, fertilizers, and raw tobacco). If fully processed goods are imported, they add to total availability on a one-to-one basis with domestically produced goods. Raw materials which serve as inputs into domestic production cannot be counted as an addition to domestic supplies if the final product has already been counted. To avoid the possibility of "double counting," imported goods have to be separated into two classes: "nonduplicated imports," and goods intended for further processing. Practically, the broad statistical classifications given in South Vietnamese statistics do not allow an unambiguous selection of products in each group. Practically, therefore, goods placed in the nonduplicated group will include some which belong in the other group and vice versa. On balance, these errors ought to cancel out.

Tables C1 and C2 show which goods have been classified as nonduplicated. The total value of these goods in 1964 was 4.6 billion piasters. The imputed value of the rice crop produced in that year was 14.2 billion piasters. (See Appendix B.) Rice was assigned an arbitrary rate of 100, and the weight for imports is calculated as $4.6/14.2 \times 100 = 33$.

Table C1

VALUE OF NONDUPLICATED IMPORTS, 1964 THROUGH 1967, AND INDEX OF DEFLATED VALUE

Class of Product	Value of Imports[a] Million Piasters				Weight[b]	Index of Real Value[c] 1964 = 100		
	1964	1965	1966	1967		1965	1966	1967
Dairy Products	621	656	1,713	1,133	0.1351	1.06	1.69	0.80
Fruit	7	9	23	74	0.0015	1.29	2.01	4.63
Wheat Flour	268	311	742	882	0.0583	1.16	1.69	0.44
Oil and Vegetable Fat	23	119	105	115	0.0050	5.17	2.79	2.19
Sugar	359	237	455	1,164	0.0781	0.66	0.78	1.42
Meat and Fish Preparations	3	3	82	72	0.0007	1.00	16.70	10.51
Prepared Vegetables and Fruits	7	12	52	77	0.0015	1.71	4.54	4.82
Miscellaneous Food Preparations	15	22	102	100	0.0033	1.47	4.15	2.92
Cement	339	354	588	833	0.0737	1.04	1.06	2.46
Petroleum Products	645	797	1,354	2,270	0.1403	1.24	1.28	1.54
Pharmaceutical Products	383	456	876	1,261	0.0833	1.19	1.40	1.44
Oil, Perfumery and Toiletry	22	34	78	108	0.0048	1.42	2.17	2.15
Rubber Tires and Tubes	188	248	325	330	0.0409	1.32	1.06	0.77
Printed Matter	48	47	193	143	0.0104	0.98	2.46	1.31
Textile Fabrics	203	195	1,103	3,581	0.0442	0.96	3.32	7.72
Ceramics	22	20	120	144	0.0048	0.91	3.33	2.87
Iron and Steel Mill	943	1,803	3,080	3,721	0.2051	1.91	2.00	1.73
Motor Car and Parts	377	445	1,479	2,491	0.0820	1.18	2.40	2.90
Cycles and Parts	124	117	1,581	3,372	0.0270	0.94	7.77	11.90
Total of Above	4,597	5,885	14,051	21,871	1.0000			
Total GVN Imports	10,421	12,507	28,385	43,044				
Percent of Above to Total	44	47	50	51				
Weighted Index						1.28	1.87	2.18

a. Viet Nam National Institute of Statistics

b. Weight $= \frac{x_1}{\Sigma x_1}$ for 1964.

c. This index is derived from US dollar equivalents of Vietnamese imports calculated at the following official exchange rates: 1964-1965, 35 piasters/$1; 1966, 57.3 piasters/$1; 1967, 80 piasters/$1.

Table C2

NONDUPLICATED IMPORTS BY WEIGHT 1964 THROUGH 1967

Product Class	Imports[a] (metric tons)					Index 1964 = 1.00		
	1964	1965	1966	1967	Weight[b]	1965	1966	1967
Dairy Products	28.5	29.2	45.0	17.4	0.1351	1.02	1.58	0.61
Fruit	0.94	0.94	1.09	2.45	0.0015	1.00	1.17	2.61
Wheat Flour	64.0	78.7	100.0	85.6	0.0583	1.23	1.72	1.34
Oil and Vegetable Fat	2.47	11.29	4.30	3.13	0.0050	4.57	1.74	1.27
Sugar	52.8	70.8	118.5	171.8	0.0781	1.34	2.24	3.25
Meat and Fish Preparations	0.11	0.07	1.84	1.45	0.0007	0.65	16.75	13.16
Prepared Vegetables and Fruits	0.49	0.82	1.34	2.57	0.0015	1.66	2.72	5.21
Miscellaneous Food Preparations	0.20	0.31	0.98	0.56	0.0033	1.53	4.92	2.78
Cement	437.4	426.1	365.1	476.2	0.0737	0.97	0.84	1.09
Petroleum Products	639.1	778.3	959.5	858.9	0.1403	1.22	1.50	1.34
Pharmaceutical Products	2.30	1.86	2.70	2.50	0.0833	0.81	1.17	1.09
Oil, Perfumery and Toiletry	0.23	0.28	0.98	0.33	0.0048	1.24	4.34	1.46
Rubber Tires and Tubes	3.5	4.4	3.9	2.7	0.0409	1.26	1.11	0.77
Printed Matter	0.73	0.70	1.30	6.65	0.0104	0.96	1.78	0.91
Textile Fabrics	1.56[c]	1.66	5.18	12.11	0.0442	1.06	3.31	7.74
Ceramics	2.38	2.50	8.31	6.30	0.0048	1.05	3.49	2.65
Iron and Steel Mill	154.0	245.1	307.3	233.0	0.2051	1.59	1.99	1.51
Motor Cars and Parts	5.25	7.32	13.97	17.05	0.0820	1.37	2.61	3.33
Cycles and Parts	2.4	2.1	10.1	19.3	0.0270	0.88	4.21	8.04
Weighted Average (Index)						1.24	1.88	2.01

a. Viet Nam National Institute of Statistics
b. Same weights as used in Table C1.
c. Figure in NIS, Viet Nam Statistical Yearbook (1964-1965) is not comparable with figures given for 1965-1967 in the Monthly Statistical Bulletin(s). Figure in this column is 91 percent of that given in Viet Nam Statistical Yearbook (1964-1965) to put it on the same relative level with the figure for 1965.

A major problem arises with regard to the index of imports. It would be desirable to use an index of change in physical units. Unit data are not available and the closest proxy is physical weight. For products such as wheat flour, sugar, and cement, weight is a proper measure and it may be a reasonably good measure in the case of tires, tubes, and motorcycles and parts. It becomes less defensible for iron and steel mill products and particularly for items such as pharmaceuticals. An index of value of imports assumes no price change over time if it is to be a true measure of "real value."

The piaster has depreciated severely since 1964. It is not clear that using the official exchange rate to obtain import values in dollars is an adequate procedure for avoiding the pitfalls of assessing a value when the value of money is changing. If the official exchange rate can be used to convert the piaster value of landed goods into a dollar value, then that conversion would give an approximately correct evaluation of South Vietnamese imports since the value of the dollar has depreciated relatively little since 1964.

Comparing the physical index with the deflated value index reveals a close similarity:

	1964	1965	1966	1967
Physical Index (Table C2)	1.00	1.24	1.88	2.01
Value Index (Table C1)	1.00	1.28	1.87	2.18

The indices move very closely together; however, which one is preferable is not simply an arbitrary matter. Since some international prices have risen since 1964 and there could have been some quality changes, one would expect the index of value to rise faster than the physical index. For all its shortcomings, the physical index is preferable because it is known some South Vietnamese importers can and do falsify their invoices, and we presume that it is more difficult to falsify weight than value.

Some of the commodities included in the tables of this Appendix obviously are not final products. Two major commodities, cement and iron and steel mill products, are examples. These commodities have

been included because their primary use, construction, has not been accounted for in any other sector. It is difficult to determine to what extent some of the other products (e.g., textile fabrics and petroleum products) actually satisfy final demand. Some products such as electronics have been completely omitted because it was not possible to distinguish consumer products from capital goods.

Logically, the same method should be used to net out exports. No weights have been calculated for exports (the weights would be negative) because by 1964 exports were playing only a minor role in the Vietnamese economy. The total value of exports that year was 1.7 billion piasters (17 percent of the value of imports). At best the export weight would be -3 percent. Since exports have declined drastically over the last three years, exclusion of the negative weight for exports as a component makes the index of availability more conservative.

Appendix D

AVAILABILITY OF RICE IN SOUTH VIETNAM AND RECOMPUTATION OF AGRICULTURAL PRODUCTION INDEX

Appendix D

CONTENTS

Table

Appendix D

AVAILABILITY OF RICE IN SOUTH VIETNAM AND RECOMPUTATION OF AGRICULTURAL PRODUCTION INDEX

Availability of rice for domestic consumption is the total domestic production (milled) plus imports, less exports, plus average stocks for the year.

Table D1

AVAILABILITY INDEX OF RICE FOR DOMESTIC CONSUMPTION, 1964 THROUGH 1967

	1964	1965	1966	1967
Domestic production (thous. of metric tons)[a]	5,185	4,822	4,336	4,475[b]
Domestic production (adjusted) tons[c]	4,667	4,340	3,902	4,027
Milled rice (tons)[d]	2,567	2,387	2,146	2,215
Plus imports (tons)[e]		130	434	770[b]
Less exports (tons)[f]	49			
Plus average stocks[e]	184	143	117	106[f]
Rice available	2,702	2,660	2,697	3,091
Index	100	98	100	114

a. Ministry of Agriculture.
b. National Bank of Viet Nam Annual Report, Fiscal Year 1967, Table 1.
c. Ninety percent of a. These adjusted figures are consistent with domestic consumption habits.
d. The milling ratio is assumed at 0.55.
e. Annual Statistical Bulletin, No. 10, U. S. Agency for International Development, p. 113.
f. National Institute of Statistics.

Using the new rice availability index instead of the domestic rice production index, an adjusted index of agriculture can be computed. Given the weight and individual indexes in Table 4 of the text, the revised yearly index is:

1965	100
1966	97
1967	103

Appendix E

WEIGHTS ASSIGNED TO SECTORS FOR COMPUTING TOTAL AVAILABILITY

Appendix E

WEIGHTS ASSIGNED TO SECTORS FOR COMPUTING TOTAL AVAILABILITY

	Points Assigned	Weight
Agriculture, total	250[a]	.68
Rice	(100)	
Industry	83[b]	.23
Imports	33[c]	.09
	366	1.00

a. Total points assigned to agriculture was established by arbitrarily assigning 100 points to rice (see Appendix B).
b. In 1964 industry contributed one-third as much to net domestic product as agriculture, therefore 83 points are assigned to industry.
c. In 1964 the total value of "nonduplicated" imports was one-third the imputed value of rice production in South Vietnam. (See Appendix C.) Accordingly, imports have been assigned 33 points.